WHAT IS CLAIMED IS:

1. A method for producing DNA, which comprises the following steps (1) to (4):

(1) dividing a target sequence which is a nucleotide sequence of DNA to be synthesized into 2N wherein N is a positive integer, of sections, designing partial sequences each containing a nucleotide sequence of each section and a part of a nucleotide sequence of an adjacent section or parts of nucleotide sequences of adjacent sections, wherein the part or parts have such a length that the nucleotide sequence of the each part can specifically make base-pairing with a nucleotide sequence complementary thereto, and preparing oligomers each having each of the 1st to Nth partial sequences from the 5′ end of the target sequence and oligomers each having a nucleotide sequence complementary to each of the (N+1)th to (2N)th partial sequences from the 5′ end of the target sequence,

(2) performing PCR by using an oligomer having the Nth partial sequence from the 5′ end of the target sequence and an oligomer having a nucleotide sequence complementary to the (N+1)th partial sequence from the 5′ end of the target sequence under such a condition that these oligomers should act as primers and templates,

(3) sequencing synthesized DNAs and selecting DNA

having a nucleotide sequence containing the Nth and (N+1)th partial sequences from the 5′ end of the target sequence, and

(4) repeating the following steps (4a) and (4b) for J wherein J is an integer, to be from 1 to N-1:

(4a) performing PCR by using the selected DNA, an oligomer having the (N-J)th partial sequence from the 5′ end of the target sequence and an oligomer having a nucleotide sequence complementary to the (N+1+J)th partial sequence from the 5′ end of the target sequence under such a condition that the DNA and oligomers should act as primers and templates, and

(4b) sequencing synthesized DNAs and selecting DNA having a nucleotide sequence containing the (N-J)th to (N+1+J)th partial sequences.

2. A method for producing DNA, which comprises the following steps (1) to (4):

(1) dividing a target sequence which is a nucleotide sequence of DNA to be synthesized into 2^n wherein n is a positive integer, of sections, designing partial sequences each containing a nucleotide sequence of each section and a part of a nucleotide sequence of an adjacent section or parts of nucleotide sequences of adjacent sections, wherein the part or parts have such a

length that the nucleotide sequence of each part can specifically make base-pairing with a nucleotide sequence complementary thereto, and preparing oligomers each having each of (odd number)th partial sequences from the 5′ end of the target sequence and oligomers each having a nucleotide sequence complementary to each of (even number)th partial sequences from the 5′ end of the target sequence,

(2) repeating the following step (2a) for j wherein j is an integer, to be from 1 to 2^{n-1} to produce 2^{n-1} of reaction products,

(2a) performing PCR by using an oligomer having the (2j-1)th partial sequence from the 5′ end of the target sequence and an oligomer having a nucleotide sequence complementary to the (2j)th partial sequence from the 5′ end of the target sequence under such a condition that these oligomers should act as primers and templates,

(3) repeating the following step (3a) for i wherein i is an integer, to be from 2 to n:

(3a) repeating the following step (3ai) for k wherein k is an integer, to be from 1 to 2^{n-i} to produce 2^{n-i} of reaction products,

(3ai) mixing a reaction mixture containing DNA having the $(2^{i}\bullet(k-1)+1)$th to $(2^{i}\bullet(k-1/2)$th partial sequences from the 5′ end of the target sequence and a reaction mixture containing DNA having a

sequence complementary to the $(2^i \bullet (k-1/2)+1)$th to $(2^i \bullet k)$th partial sequences from the 5′ end of the target sequence and performing PCR under such a condition that DNAs contained in the reaction mixtures should act as primers and templates, and (4) separating DNAs having a length expected from the target sequence from the reaction mixture, and sequencing the separated double strand DNAs to select a double strand DNA having the target sequence.

3. The method according to Claim 2, wherein, in the steps (2a) and (3ai), a ratio of the oligomers added to the reaction mixture or a ratio of the reaction mixtures to be mixed is adjusted so that a single strand DNA required for a subsequent step should be synthesized in an amount larger than that of the other single strand DNA.